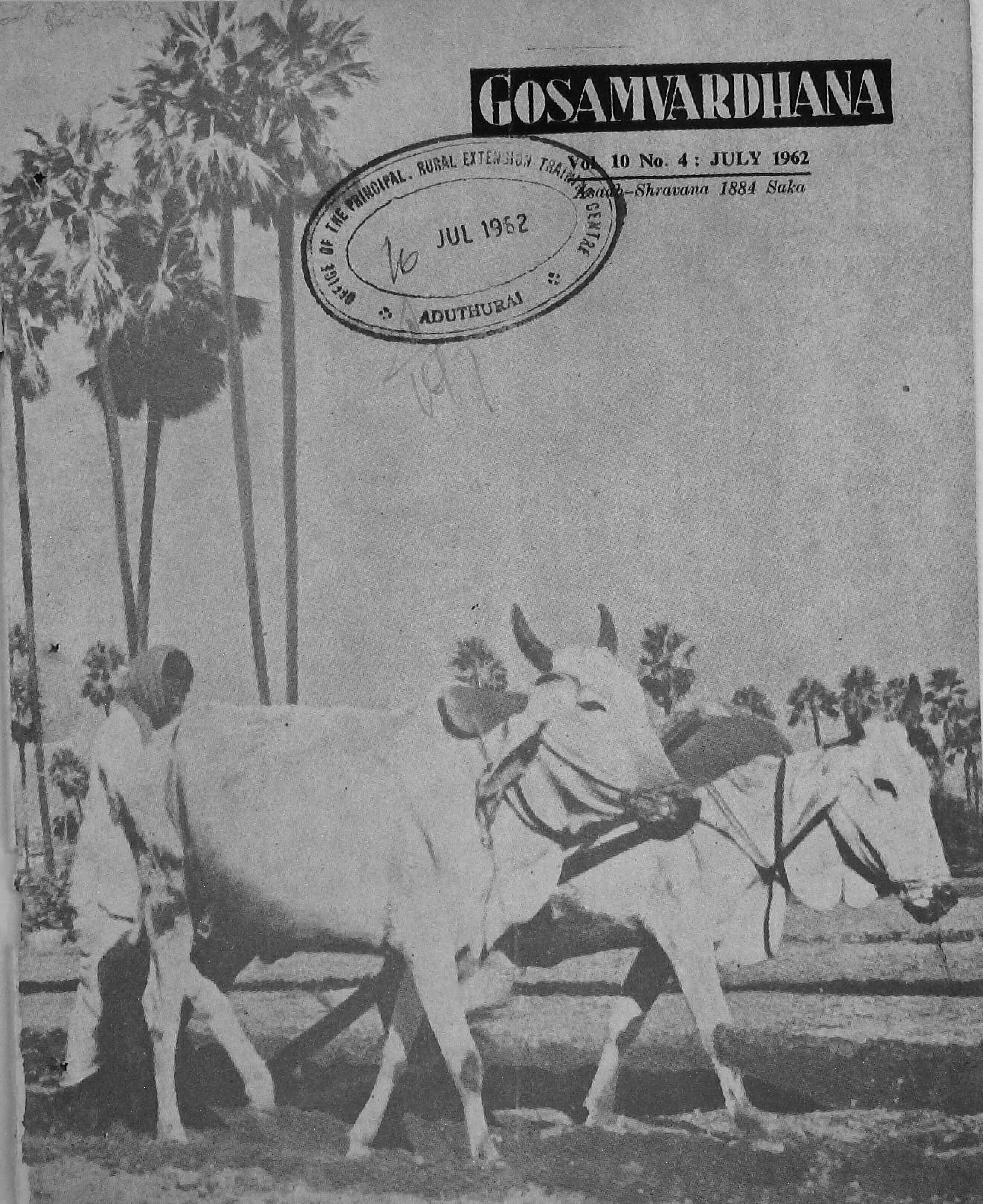
GOSAMVARDHANA

Vol. 10 No. 4 : JULY 1962
Asadh-Shravana 1884 Saka

OFFICE OF THE PRINCIPAL, RURAL EXTENSION TRAINING CENTRE
16 JUL 1962
ADUTHURAI



THE SECRET OF GO-SEVA

THE service does not mean service-without-utility. That means to serve the useful animal as much as possible. It implies that we have to add to the usefulness of such animals to the highest possible extent ; and it is only in this way that we can render best service to the animal as we do for our children. Thus, for us, the service is interlinked with the usefulness and utility. I shall go a step forward. As we cannot render service without utility, so we should not derive the utility without rendering service. We do render some service to the animals but don't have a scientific and academic vision ; we may take some help from the specialists in this work but the entire work cannot be left only to them. We should render direct service to the cow. In this process, we may find out something of the science of Goseva also.

....An inmate of our Ashram, Bhai (brother) Namdev has been rearing three-four cows. One day, he had to go out for the day. In the evening, on his return, when he sat for milking the cow, she did not yield milk. He tried to milk but to no avail. Then, he enquired from other colleagues as to what had happened and what could be the reason for that "un-cooperative attitude of the cow". The answer was : "Nothing specific has happened. Even the calf has been kept away and, therefore there is no possibility of the calf having sucked milk from the cow." Namdev further asked them, "did any body beat the cow". An other inmate replied: "Yes ! Of course, she was beaten." "That's the reason, she doesn't yield milk," exclaimed Namdev. He went near the cow; patted her with 'affectionate' touch of his hands. And the result was that the cow was ready to yield milk. This incident should make us understand that when we render service as Namdev did; the secret of service will be gradually unfolded to us and from this will develop the science of Go-seva.

The cow is a liberal creature. She does recognise our service and attitude of love with appreciation; and is prepared to shower upon us with maximum benefits......The *Summum Bonum* of this is that we cannot render real service to anyone withont adding to the usefulness of that entity and secondly; if we derive benefits without rendering any service—that would constitute a sin.....

—VINOBA BHAVE

EDITORIAL BOARD

Chairman

SHRI L. SAHAI

—Animal Husbandry Commissioner with the Government of India

Members

SHRI RADHA KRISHNA BAJAJ

DR. P. BHATTACHARYA

—Livestock Development Adviser to the Government of India; and Secretary (Official; CCG)

SHRI Y.M. PARNERKAR

—Secretary (Non-official; CCG) and **CHIEF EDITOR**

Issued Monthly By The
CENTRAL COUNCIL OF GOSAMVARDHANA,
(Ministry of Food & Agriculture)
Pataudi House
NEW DELHI
Tel. No. 45330

P. C. ARYA
Asst. Editor

Greesh B. Mathur
Sub-Editor

GOSAMVARDHANA

Vol. X] July 1962 [No. 4

ASHADHA-SRAVANA 1884 Saka

CONTENTS

On Scientific Planning —*Editorial* .. 2

Kumiss—A therapeutic milk beverage —*Prof. K. C. Mahanta* .. 3

Problems arising from the use of antibiotics —*Shri D. Jayaraman* .. 6

Utilisation of cattle waste; and marketing of livestock, milk and milk products —*Shri Y. M. Parnerkar* .. 8

Wealth from dead animals—A Review .. 11

Trends in Animal Husbandry—A Survey —*Shri D. Krishna Murthy and* —*Shri K. N. Sharma* .. 14

Analysis of milk and the effects of stage and number of lactation on its composition —*Shri M. Misra and* —*Shri N. C. Nayak* .. 21

Cattle Census 1961 .. 25

Place of cattle in Indian economy —*Prof. G. S. Rajorhia* . 31

Subscription Rates

Annual	.. Rs.	6-00
Single Copy	.. Re.	0-50

OUR COVER :—Pangs for Prosperity

Editorial

On Scientific Planning For Cattle Development

NOW a period of positive attention, if not activity, in the field of cattle development in our country, can be said to have started. A financial provision of Rs. 34 crores for dairying and Rs 56 crores for animal husbandry including cattle development in the IIIrd Plan—though may not be completely sufficient—is a good augury.

New projects of dairying are being undertaken in the country and a number of smaller and bigger schemes connected with the work of dairy development and also to improve the position of milk supply are under way. The development of dairy work and other such modern schemes require not only technically and technologically advanced knowledge but the process of science has to be applied in its entirety and taken to the logical conclusions. Not only the dairy equipment, the complicated plant and efficient and trained personnel are of basic importance but the over-all planning of a dairy project coordinated with the live-stock development work has to be comprehensive and scientific in its real sense.

We are prone to overlook the tomorrow when we plan for today. In the sphere of cattle development or when a particular project is taken up in this regard, the tomorrow is equally important as today, because what may appear to be very beneficial and outwardly good may bring more harm after a span of a decade.

It is in this context that we should give a serious thought and pay an equal attention to the planning aspect of any project undertaken in the field of dairying and cattle development keeping in view the future repercussions.

Whenever any dairy project is undertaken, there is a tendency to drift our attention limited to the success of that particular project. When a dairy unit is established, around that project the best animals from the breeding tract are selected and brought to the area feeding the dairy unit—that is to say leaving behind only second best animals in the surrounding breeding tract.

The same procedure is repeated year after year and thereby the second grade animals left in the breeding tract, that now constitute the best in that area will come and occupy the place in the area feeding the dairy unit. This would subsequently result in the deterioration of the quality of animals in the tract when such a dairy unit or project is undertaken. For some period, that project may appear to be prospering with the best animals, but then, indirectly we have brought down the quality of the animals in the country as a whole.

Serious consideration has to be given to such unscientific development. Do we sacrifice the tomorrow for today. And, then, the tomorrow has to become today.

Our suggestion would be to reverse the order in the interest of real cattle development. To suggest, the best animals brought from the breeding tract should not only be properly maintained by the area feeding the dairy unit rather vigorous efforts should be made to develop further progeny on the basis of these best grade animals within this area itself. On the other hand, the cow-keepers in the breeding tract should be given impetus to develop their animals to the category of highest grade animals. This two-fold coordinated development will make the area feeding the dairy unit strong, solid and self-sufficient. And the breeding tract will not be adversely effected.

The dairy project or the unit instead of becoming an impediment in the growth of livestock wealth will rather make a positive contribution to it.

This is the scientific corollary on the planning side which is equally important than the mechanical equipment.

KUMISS

A THERAPEUTIC MILK BEVERAGE

By
Prof K C MAHANTA
Assam Agriculture College

KUMISS—a sour milk beverage is known from time immemorial as a therapeutic agent against many diseases. This product is not familiar among Indians, but it was long known among the Mongols, Tatars, and other inhabitants of Central Asia. Inhabitants of Caucasus used it most extensively and there are various references to it in the Greek history and in the history of the Central Asian regions.

Kumiss was mainly prepared from the mare milk. Central Asian nomades kept horses as their beasts of burden and they used the milk from the mares for the preparation of kumiss. It is a fermented milk beverage, the chief products of fermentation being alcohol and lactic acid. It is usually prepared from raw mare milk. The milk is poured into wooden barrels and mixed with previously prepared curd from cow milk. This curd is of the consistency of semi solid *dahi*. The amount of curd used is about 25 percent of the total volume of mare milk. Mare milk is thoroughly mixed with the curd by brisk agitation with a wooden stirrer. The stirring is continued for about 20 minutes after which it is left for half an hour. Stirring is again continued for about 20 minutes and kept undisturbed for another half an hour. This method of stirring and rest is followed for three or four times till the kumiss attains its characteristic taste and flavour. It is then poured into bottles and the bottles closed with crown corks. Bottles are kept at a cool place for about three to four hours for the accumulation of gas. Kumiss is then ready for consumption. This is in short the method of preparation of kumiss from mare milk.

Two types of fermentations are involved in the preparation of kumiss. Firstly, as in other sour milk preparations, lactic acid fermentation is caused by lactic acid bacteria. Secondly, unlike in other sour milk preparations, alcoholic fermentation takes an

important part and is caused by lactose fermenting yeasts. Alcoholic fermentation is more important in kumiss preparation, as it imparts a favourable taste to the product and most of its therapeutic value has been attributed to it.

Mare milk is used for kumiss preparation because it is rich in lactose (milk sugar) content. The lactose content of mare milk is about 6.3 percent, whereas the lactose content of cow milk is only 4.7 percent. Lactose is fermented by lactic acid bacteria and lactic acid is produced, which makes the product sour. Lactose is also fermented by yeasts and alcohol is produced along with carbon dioxide gas. It is, therefore, evident that if the lactose content of milk is more, the amount of alcohol production would also be more. In the production of lactic acid, bacteria can tolerate the accumulation of acidity only to a certain limit, whereas the yeasts are active even at a comparatively higher acidity.

Mare milk is poor in fat content ; it contains from 1.6 to 2 percent butterfat. This is two to four times less than the fat content of cow milk. It is poor in protein content also, but its protein content is present in more soluble form, which is easily digested by the system. It is rich in vitamin C content and contains vitamin B 12, which is very important in human nutrition. As a result of the presence of the soluble form of protein the curd particles formed in the souring of mare milk are comparatively smaller and hence easily digestible. These points indicate that mare milk is relatively better in human nutrition than cow milk, specially in the case of patients.

Even in the native places of kumiss, mare milk is not available in sufficient quantities and it is produced only during the summer. In India mare milk is practically not at all available. These factors led to the investigation of using cow milk for the preparation of kumiss. Successes in this line have been made in the Soviet Union, where both the public and the State take an active interest in kumiss therapeutics. The usual process of preparation of kumiss from cow milk is the same as from mare milk. Skim milk containing about 1.5 to 2 percent fat is used for this purpose. When whole milk is used it is mixed with about 20 percent of water. About 5 percent sugar is added to this milk. To this milk and sugar solution about 25 percent of previously prepared *dahi* may be added and the process continued as described in the preparation of kumiss from mare milk. In order to expediate alcoholic fermentation few pieces of bread may be added. This is done in order to add yeasts from the bread. Kumiss prepared in this way from cow milk compares very well with that prepared from mare milk. The alcohol content of such kumiss is also as much as 1.75 to 2 percent and the carbon dioxide gas production is also very vigorous.

Kumiss is white in colour and almost liquid in consistency. Its curd particles are very finely dispersed. This is because of the presence of gas and also because of the lower amount of proteins present in the milk. Its taste is pleasant and sour. Presence of alcohol and carbon dioxide makes it a pleasant beverage, specially during summer months. Due to the presence of alcohol and carbon dioxide it is very easily assimilated in the intestine, and almost all the proteins, fat and sugar are digested in the system. Because of this fact extensive use of kumiss among the tuberculosis patients soon results in the considerable increase in their body weights.

The therapeutic value of kumiss is dependent not only on its chemical composition, but also on other factors. It normalises the

secretions of the intestine. If kumiss is consumed about 1½ hour before meals, it increases the appetite and increases the functions of the digestive system. The lactic acid bacterial flora of kumiss supresses the growth of the putrifactive organisms in the intestine. Kumiss helps in the formation of blood cells.

Besides the above mentioned beneficial effects of kumiss, it possesses antibiotic properties against tuberculosis. For this purpose it is used in the Soviet Union in various sanatoria. Such sanatoria are located in the south eastern regions of the Soviet Union and to each of them a kumiss manufacturing farm is invariably attached. The usual dose of kumiss prescribed by the doctors is about half a litre per day at the beginning, which is gradually increased to two litres a day.

The question is often asked, 'Is it possible to replace kumiss from mare milk by the kumiss from cow milk ?' With this object in view Dr. Tolmacheva used kumiss from cow milk in the sanatoria at Khrenovski in the Soviet Union and she came to the conclusion that the antibiotic properties of kumiss from cow milk are as much as that from mare milk. It is, therefore, advised that even in India we may try using kumiss on an extensive scale to combat the attacks of tuberculosis. Kumiss is very helpful in fighting against tuberculosis at least in its convalescing stage. Not only kumiss, but also other milk beverages prepared by combining lactic acid and alcoholic fermentations possess therapeutic values against tuberculosis. The production of such sour milk beverages should be encouraged by all concerned as it is very simple and needs very little of equipment.

Subscribers Please !

Kindly ensure that the journal is regularly received, in time, by you. At the latest, the Journal should reach you by the 20th of every month. It will be appreciated if an intimation regarding non-receipt of any issue is sent to this Council before the close of the month to which the particular missing issue relates. While corresponding with the Council, please quote, without fail, your subscription number.

PROBLEMS
arising from the use of
ANTIBIOTICS

by Shri D Jayaraman
Dairy Development Officer
Hyderabad

THE use of antibiotics such as pencillin, streptomycin aureomycin, neomycin and other forms in the control of mastitis is well established practice. But in recent years practical experience by the result of scientific investigation has made it clear that a number of very undesirable consequences have arisen as a result of indiscriminate use of antibiotics for mastitis control. It seems that despite the widespread use of antibiotics, there has been no change in the incidence of mastitis in U.K., New Zealand and Australia. As a consequence it becomes necessary to produce a new drug to control the ravages of the particular disease and develop a race between bacteria and man to produce resistant strains and new drugs. This is most unsatisfactory and it is becoming more obvious that there is little use in treating the symptoms without attempting to deal with the underlying cause of the disease.

If we consider mastitis as a particular case, it is not a simple matter to eliminate it completely. There is universal agreement amongst experts, that under damage caused by excessive vacuum in milking machines, failure to remove teat cups at the correct time, improper sterilization of the utensils and lastly due to the staphylococci penicillin resistant the disease is still persisting. Because of the availability of antibiotics the dairy farmers are tending to use them more frequently than may be necessary. The use of strip cup, care and attention to details of the mechanical efficiency of the milking machine and the practice of milking infected cows last, should always be uppermost in the minds of the dairymen and recourse should be made to treatment by therapeutic means only when these other methods have failed. The milk that contains staphylococci which are penicillin-resistant are potentially pathogenic capable of causing food poisoning.

What then is the result of this misuse of antibiotics ? It has many repercussions. We look on the effect on cow and the quality of

the resultant product. The organisms of the mastitis had become so resistant to known antibiotics and their administration is likely to be almost useless. The dairymen can stand to lose economically on two counts—the cost of unnecessarily high dosage of antibiotics and loss of production.

Another aspect causing concern is the inhabitory effect of milk containing residual antibiotics in milk, cheesestarter cultures, since some of them can give rise to dangerous allergic reaction in sensitive individuals. It is estimated that about 10% of the population in America is sensitive and it is likely that the proportion would be much the same in this country. It has been ascertained quite conclusively that penicillin is not found in powdered milk, evaporated milk, ice cream and butter. It is a blessing in disguise. Penicillin is not found after 72 hours of the treatment.

The presence of residual penicillin in milk is a problem in the manufacturing process of any dairy product involving microbial activity. It is also a public health problem and the dairy industry problem. To detect this, it requires a simple, reliable factory test. A simple test for the detection of penicillin by Barbara P. Keogh C.S.I.R.O. Melbourne is sensitive at concentration of about 0.03 units/Ml or greater. Because of its simplicity, the test lends itself readily for use in dairy factories and the milk plants as a tool in the elimination of potentially beneficial measures. The main point at issue is to draw the attention of farmers the absolute necessity to utilise these substances strictly in accordance with the Veterinary Surgeon's directions. Infusion of penicillin at the end of lactation period and allowing it to remain in the udder until the cow freshens again is the best safeguard against the disease. Restrictive measures may safeguard the health of the community but no solution is acceptable which does not aim at the ultimate control of mastitis. The first step towards this objective should be a combined effort by field officers and farmers to ensure the employment of good management practices, together with the proper working o milking machines and the judicious use of antibiotics. The method consists of incorporating in the antibiotic preparation a dye which colours the milk of cow or buffaloe which will help to recognise at a glance on the factory platform for timely rejection. Dairymen should adhere to the requirements that milk from penicillin treated cows or buffaloes should not be supplied for the sale unless 72 hours have elapsed from the time at which the last dose of antibiotic was given. The abuse of these items can have serious and far-reaching effects upon the economy of the dairy industry if it is neglected.

• *The Chief Editor reserves the right of translating and publishing any Hindi article into English.*

• *The views and opinions expressed in the contributed articles do not necessarily reflect the views or opinions of the Chief Editor, or the policy of the Journal.*

A Heart To Heart Talk
By The Chief Editor

ON THE UTILISATION OF CATTLE WASTE......

THE Indian cow keeper well realises the value of the cow not only as a producer of bullocks or yielder of milk but also as a producer of valuable organic matter for feeding the soil on which she and her owner lives. It is due to this fact that in spite of the long period for which we have been taking crops from the soil, season after season, we have been able to obtain some sort of yield from this soil. It is at the same time observed that full use of the manure is not being made. Most of the urine remains uncollected. A good portion of the cow's dung is being used as fuel. Whatever remains after this, is kept in open heaps which results in greater wastage. Not only that it breeds many insects like flies; but also contaminates the atmosphere. In a developing country like ours this cannot obviously be allowed to continue. Steps will have to be taken to utilise all the farm waste, cattle urine and dung in such a way that maximum use could be made in supplying nutrition to the soil and keeping the village clean and free from avoidable diseases.

Urine is very valuable and is produced by the body and it contains a good percentage of nitrogen and that too in a soluble form. The cow urine is obtained either in the field while grazing or in the barn. Effective methods of collecting the urine from the field are not yet known. But when the cow grazes on the owner's land this urine is not completely lost.

The urine excreted in the cattle shed can be preserved by (a) making the floor water-proof and construction of drains to which it can flow to the nearest collective pit, (b) kutcha floor of the cattle shed is well leveled. Urine is allowed to be absorbed in the floor. Occasional dressing of dry earth will keep the place dry and clean. From time to time, the floor of the shed is dug up and transported to the manure or compost pit. (c) wherever possible dry leaves, grass bits etc. are collected and spread on the floor of the cattle shed to absorb the urine. This material is collected and again passed on to the compost pit.

The Dung : The easiest way of collecting the dung is to remove it from the shed and pass on to the compost pits. It is a practice in some areas, especially in cold places to allow the dung to remain in the shed even. They spread up and litter in quan-

tities is added. The heap goes on increasing and after a time all this made up manure is collected and spread on the land and ploughed up.

At a convenient distance from the cattle shed, pits of suitable sizes are dug up and every day dung and urine is spread in thin layers. It is then covered with some farm waste. The layer goes on increasing and when it attains some height from the ground level it is covered up with earth.

Gobar Gas Plant :

The dearth of fuel induces the cattle keeper to utilise the cow dung as fuel. Experience has shown that if this dung with or without a portion of litre broken in very small bits is allowed to foment in specially constructed pits, it will give out a kind of gas which can be easily collected in specially constructed drums. It has also been seen that by this method there is no loss of manurial value of the dung on the other hand. It is made more soluble. The panchayats of the village should contact the nearest agricultural officer and through his help get constructed these gobar gas plants according to the requirements of the village. Lately the scientists are trying to prove that well constructed gobar gas plant will not only provide fuel and light for the villagers but will supply power for small scale industries in the villages. If fully used it will add one more item towards the earning side of the cow and help her to become self-financing. The cleanliness thus brought in the village will go a long way in maintaining the health of the villagers.

Every year a number of animals die in the village due to old age and natural calamities. Epidemics also take a heavy toll. The dead bodies of the animals in many cases are left uncared for which greatly result in the spread of diseases and bring about unsanitory conditions.

Every village panchayat should set apart a small piece of land well fenced up. All the dead animals of the area should be brought to this place. This animal is very scientifically flayed. The hide is cured and other parts that cannot be used for any industry are turned into manure. Fresh bones etc from healthy carcass can be artificially dried and used as chicken feed etc. Bones are crushed and used as bone meal. Animals that die of contagious diseases especially anthrax are better burried with good quantities of lime etc.

It will also be economical if small scale modern tanneries are organised between a group of villages and the treated hides in the locality are collected in these tanneries and the leather used for commercial purposes. This will provide a useful industry for the down-trodden harijans of the localities and help increase the earnings of the villagers.

.... It is most essential that steps should be taken to utilise all the farm waste, cattle urine and dung in such a way that maximum use could be made in supplying nutrition to the soil and keeping the village clean and free from avoidable diseases.

...... And Marketing of Livestock, Milk and Milk Products

Experience on cow keeping gained by years of service has clearly shown that the best way of salvaging the cow is to find out remunerative market for the products of the cattle industry. Unless and until the cow keeper is assured of reasonable income from his animal, he will not feel interested in taking care of his stock. It is a common experience that the organisation of cattle markets has greatly influenced the production of good animals, especially bullocks in the locality. These markets need some sort of overhauling or reorganisation according to the changed circumstances. Authorities can greatly help cattle development work by taking necessary steps.

Marketing of milk and milk products has today become a very ticklish problem. Adulteration is so rampent that an average consumer has lost his faith in the purity of the products and easily gets to the use of the artificial products. This problem especially in the villages has to be tackled in two ways :

The production of quality produce at reasonable and cheap rates has to be encouraged and even subsidised. The consumer has to be provided satisfaction by assuring him of the full use of his money that is spent. The village panchayat can do a lot in this respect. Cooperation amongst the producer will greatly help in standardising the products. Efforts should be made to keep the cows under the personal care and supervision of the owner and all the services should be on cooperative basis.

The country is now advancing towards the organisation of dairy units in the country. It is contemplated that milk and milk collection would be collected cooperatively and marketed at no-loss-no-profit basis. This will fill in a great need in the marketing aspect of our livestock breeders. The village Panchayats can contribute in making the cow keeping not only the occupation based on charity and religion, but make the cow the real mother of prosperity.

• Y M Parnerkar

It Pays to Advertise in Gosamvardhana

WEALTH FROM DEAD ANIMALS

A REVIEW

IMPROVEMENT of the standard of living of the weaker sections of the community like chamars, harijans and untouchables should be given priority while planning for the uplift of the society, observed Shri Vaikunth L. Mehta, Chairman of the Khadi and Village Industries Commission.

He was delivering the valedictory address to the trainees who had completed their course in intensive training in flaying and carcass utilisation at the Kora Kendra, Borivli. The function was held at the Commission's Central Office on June 7, 1962.

Recalling the discussions held at the Ooty Seminar, Shri Vaikunth L. Mehta said that the Seminar was organised with a view to clearly defining the country's approach to the Third Five Year Plan in the context of the acceptance of the principle of a socialist society. The plan, it was thought by the Seminar, should help bring about conditions of social equality and eradication of poverty, in consonance with the social ends and the human values accepted by the nation.

Measures Needed

The Seminar had asserted that, to enable the numerous households in rural areas to earn a little more and to make a contribution to the national output, systematic, well-organised measures must be taken. This, Shri Mehta pointed out, was particularly applicable to chamars whose living standard was still at the lowest level. This weaker section of the community deserved all sympathy and no efforts should be spared to improve its standard of living.

Significant Role

Speaking on the role of animal husbandry, Shri Mehta said that recently he had read in a magazine that one of the reasons for India's backwardness was that the cattle population there was more than necessary and it was still on the increase. In this connection he referred to an article by Shri U.N. Dhebar in the *Khadi-Gramodyog* (June, 1962) on animal husbandry. The article pointed out: "We need seven crores of bullocks; we have got only 6.5 crores, according to the 1956 census. We need five crores of cows if we want to supply one crore of bullocks every year while we have only 4.5 crores of them. I do not understand how we have come to the conclusion that we are surplus in cattle-wealth".

Nation's Wealth

In ancient India, Shri Mehta recalled, cattle

were considered as an important source of income. But with changing times people's attitude to cattle changed. Although Gandhiji was definitely opposed to cow slaughter, he never objected to the "exploitation" of a dead cow, Shri Mehta reminded. Gandhiji had stressed the need for the utilization of carcass and flaying of dead animals to improve the village economy. There was, therefore, nothing wrong if a dead animal was utilised for the benefit of the living man.

Shri Mehta added that it was essential that animal husbandry, within agricultural sector, was accorded special importance.

Wealth From Waste

Shri Mehta desired that the Khadi and Village Industries Commission should also give increasing importance to this particular aspect of leather industry. Added emphasis was being placed on exportable commodities and exchange earning goods these days. From this point of view also development of leather industry deserved priority.

To facilitate the work of artisans engaged in leather industry in villages, small workshops and tools should be provided. He was happy that the trainees utilised their time in doing special research for bringing out results useful to society. This was, according to him, one of the best outcomes of training. Bone Charcoal and Bone China were certainly new things which could be described as wealth from waste.

Save Foreign Exehange

Shri Pranlal S. Kapadia, Member-Secretary of the Khadi and Village Industries Commission, in his speech explained that by fully exploiting the dead cattle, considerable foreign exchange could be saved. It would not only add to the national wealth to the extent of rupees one hundred per animal but also produce commodities like neat's-foot oil and Bone China and many other useful things which were being imported at present.

Shri Kapadia pointed out that it was an important outcome of allowing the trainees to conduct experiments in a small laboratory, in addition to their prescribed curriculum of studies. They thus extracted oil from neat's-foot. This oil produced by the trainees was almost as good in quality as the oil imported from abroad. The other outstanding product was Bone China which was utilised for manufacturing good quality pottery.

Full Utilisation

Shri Kapadia, who is also in-charge of the leather industry of the Commission, said that in the intensive flaying centres of the Commission, carcasses would be fully exploited in order to bring out valuable components like organic manure. Even the waste water had its own worth. Glue, jelly and pigment peacock colour were some of the other products that could be derived from the carcass.

He exhorted the trainees to contribute their mite to the process of increasing the national wealth by fully utilising 180 lakhs of animals dying in the country every year.

He was happy that the exhibition organised by the trainees on the occasion depicted various uses of a dead animal.

Training Course

Earlier, welcoming the Chairman and the guests, Dr. D.K. Ghosh, Director of the Leather Industry of the Commission, explained the training scheme. He mentioned that at the instance of the Member-Secretary about a year and a half ago, a training course in intensive flaying and the economic exploitation of the

carcasses was arranged for the field staff of the Commission and for a few artisans from the institutions which had taken up the schemes.

There was no doubt that members of field staff were qualified technicians in leather technology but, with the passage of time, new techniques were introduced in the processes. Training courses for the staff of the industry were conducted in three different batches during the course of the last one and a half years, informed Dr. Ghosh.

Continuous Research

He said that research was a continuous process. During the first training course conducted at Kora Kendra near Bombay city, even with the meagre facilities, they could produce neat's-foot oil, valuable oil, used for precision machines. Similarly, during the second training course conducted at Paschim Banga Khadi Kendra, a glue-making vessel was invented. The third training course, recently conducted at Kora Kendra again, had indeed yielded more fruitful results. A process had been tried to make bone charcoal by burning raw bones. The trainees were successful in extracting oil from bones, a very useful product for the manufacture of nail polish.

He hoped that with the knowledge imparted to them they would be able to contribute their mite for the successful implementation of the scheme under this industry.

Progress

Shri Phool Chand Agarwal, Regional Organiser for Leather in Uttar Pradesh, who was also a trainee, read out a report of the training activities carried on at the three camps. He said in the three training camps organised by the Commission so far, 102 trainees had been imparted training in the recovery of carcasses. During the course of their training, the trainees flayed 118 carcasses recovering all the components. They also worked in the laboratory and carried out fruitful research in refining of neat's-foot oil, preparation of di-calcium phosphate by chemical method and electrolisis method and preparation of animal charcoal and its by-products such as bone tar, pyridine etc.

Besides theoretical lectures and reading the trainees were asked to prepare notes on technical subjects.

Among those who attended the valedictory function were, besides the trainees, Shri V.V. Jerajani, Member, Khadi and Village Industries Board, Shri V. Subramanian, Chief Executive Officer, Shri B.P. Umarji, Deputy Chief Executive Officer, other senior Officers, and members of the staff of the Commission.

The Exhibition

An interesting exhibition was organised by the trainees on this occasion. Various components recovered from a dead animal along with their prices and other statistical charts were exhibited. Neat's-foot oil, tallow, Mono-Calcium, Di-Calcium and Tri-Calcium phosphates produced from bones, chicken food, hides and manures, bone oil distilisation plant, were among the exhibits.

(*—Jagriti*)

A Survey in a Part of the Uttar Pradesh

TRENDS IN ANIMAL HUSBANDRY

by
- Shri D Krishna Murty
- Shri K N Sharma

INDIA is predominantly an agricultural country and according to the recent census 82.7% of the population live in rural areas although, there had been considerable efforts for industrialization of the country during the past few years under the national plans, yet the distribution of population in rural and urban areas is almost the same as in the previous census, indicating still the importance of agriculture in the economy of the country. Majority of the rural population seek their livelihood through agriculture and animal husbandry. The rural practices are such that agriculture and livestock are inter-dependent and inter mixed to such an extent that estimation of exact extent to which each of these industries contributed to the prosperity of rural population depends to a large extent on the investigational procedure and the pattern of statistical analysis followed. Since the Royal Commission on Agriculture 1928, several surveys have been carried out to study the trends of agricultural practices both on regional and national basis, but hardly any systematic investigations were undertaken principally to survey the trends in animal husbandry. As such the information available on animal husbandry practices is very limited and mostly trickled out from the agricultural surveys carried out and as such were generally biased towards agriculture. With a total livestock population of over 307 millions a study of trends in animal husbandry in rural areas is likely to yield valuable information for systematic planning for improvement of livestock. In this brief report it is proposed to record an investigation carried out to study the trends in animal husbandry in selected villages in Mathura Block.

While most of the rural statistics published by the Government are collected by Lekhpals, Amins, Patwaris or other State revenue officials, in this investigation a basic deviation was made in the procedural pattern by utilizing the final year Veterinary graduate students as investigators and the survey work

A UNIQUE FEATURE OF THE SURVEY WORK, THE REPORT OF WHICH IS PUBLISHED IN THESE PAGES, WAS THAT IT WAS CARRIED OUT DURING THE SUMMER VACATION BY THE FINAL YEAR VETERINARY GRADUATE STUDENTS AS INVESTIGATORS AS PART OF THEIR ANIMAL HUSBANDRY EXTENSION PRACTICAL TRAINING.

was carried out during the summer vacation as part of their animal husbandry extension practical training.

Procedure of investigation

Selection of villages: The villages for this survey were selected from Mathura Extension Block, which is attached to the U.P. College of Veterinary Science and Animal Husbandry and comprises of 74 villages situated around this institution. According to the classification by Randhawa (1959) of the agricultural regions in India, this area falls under the dry northern wheat region with an average rainfall of less than 30″ per annum. A preliminary survey was carried out in 24 of these villages six months prior to this study, in connection with a rural survey to study the incidence of Brucellosis and based on the observations made during investigation, six representative villages were selected depending on their location, communications, agricultural and animal husbandry practices, application of extension programmes, ambulatory clinical facilities and other activities. Two of these villages were situated on the road side, two of them in the interior region with no suitable approach roads and two were of intermediate category situated about one or two miles from the main roads but with approachable side roads. Based on the extension activities, two of these villages were considered by the block officials as model villages and received most of the benefits of extension programmes, two of them had hardly received any help and two with only moderate help. Three of the villages were predominantly agricultural while the other three depended mainly on animal husbandry and dairy. Three of the villages have ambulatory clinics of the Veterinary College and students of the final year class visit those villages regularly once in a week for treatment af ailing animals. Thus every effort was made to select these villages with a view to be fully representative of the whole block. The six villages thus selected were Umari, Nagari, Bakalpur, Bhainsa, Raal and Jachonda.

Programme of Survey:—The house to house census work was carried out by the students of the final year class of the Veterinary College. A detailed questionaire was prepared and the students were appraised of the nature of information to be gathered, the type of question to be asked and the manner of recording the replies in a uniform pattern on the printed questionaire sheets. In order to make the survey operations useful and interesting to the villagers, simultaneously, mass vaccination against Haemorrhagic Septicaemia was carried out by the same batch of students in the respective villages with oil adjuvant vaccine. This area is endemic for Haemorrhagic Septicaemia and the annual vaccination has to be carried out during the summer season.

The party of students and staff went to the respective villages in the evening by the college bus and carried out the survey upto late in the night. Although in the beginning of the survey both morning and evening visits were made to the villages, it was observed that the evening times were better suited for this type of survey than the morning period, since all the villagers as well as their livestock were available in each house in the evening and the villagers after the day's hard work were free and relaxed, to answer to the numerous questions the investigators leisurely. The entire party was divided into different batches and each batch was supplied with a list of the families in the area to be covered by them so that there is no duplication in filling up the questionaires by different batches. Separate printed forms of the questionaire were used by the investigators for recording the data of each family. The procedure of filling up the forms was practically demonstrated by the senior author to each batch in the first few families recorded by them. After the day's survey about 10% of the families were requisitioned by the senior author to verify the accuracy of the data collected. With each student batch, usually one staff member of the ambulatory clinics was also deputed to guide the students in the recording of the questionaire and in carrying out the mass vaccination programme. Each batch moved from door to door and collected the data by questioning the head of the family and if he is not available or unable to give satisfactory answers, the educated member of the family, either son, daughter or wife was questioned. It is gratifying to note that there had been extremely high voluntary co-operation from the individual families in all these villages and, as such, not even a single family had been left out in any one of the villages from the survey.

Result of the Survey

During the survey detailed data were collected from 865 families which included all the families in the six selected villages. The data thus collected has been analysed and the following are the main facts and figures of these villages.

Land holdings and distribution:—The *table (Table No. I) shows the area of land available for cultivation in each village to meet the food requirements of human beings as well as animals. It wonld be observed from the table, that the cultivable land available varied from 108 to 664.4 acres. On an average only 70.0% of the families possessed land while the remaining 30% were landless families living on other sources of Income. The average land available per family is 2.6 acres and varied on an average from 2.3 to 2.9 acres. Randhawa (1958) has recorded that the average size of holdings in Uttar Pradesh as 5.3 acres and that the lowest size of holdings in India is in Kerala where it is only 2.4 acres. The size of land holdings in these villages neared the Kerala figure.

*The relevant tables appear in the end of the article.

Size and composition of families :—The following table (Table No. II) shows the distribution, size and composition of families in each village. In this table, the term "Children" has been used for all children below 12 years of age. It would be observed from the above table that the average size of the family is 6.0 and that the proportion between the females to males to children is as 1.0 : 1.1 : 1.5. It is interesting to note that the number of adult females are less than adult males.

Distribution of livestock and livestock holdings :—The following table (Table No. III) shows the distribution of livestock and the size of livestock holdings in these villages. It would be observed from this table that 73.6% of the total families possess livestock, 18.2% of families who have livestock have no land and 4.3% of families possess land but no livestock. It would be interesting to note that more families possess livestock than land. The size of livestock holdings varied from 0 to 35 ; 48.3% of the families maintain livestock between 1 to 4 and 41.0% of families keep livestock between 5 to 9 these two groups accounting for 89.3% of all families maintaining livestock, thus indicating that the size of livestock holdings is very small and is usually below 10.

Species-wise distribution of livestock :—The following table (Table No. IV) shows the distribution of different types of livestock in these villages. It would be observed from this table that 88.0% of the livestock maintained in these villages are cattle and buffaloes but almost all types of domesticated animals including camels are available. The presence of a few camels could be explained by the fact that this area is located on the perimeter of Rajasthan desert. It is interesting to note that there are hardly any poultry in these villages and three of them have no poultry at all. During the interogation of individual families, it was observed that except for one family, all the rest of them were either aversed or not interested in poultry keeping. Similarly three of the villages do not have any horses and there are a few of them only in those villages which are on the road side and are near the urban area. Since all other types of livestock excluding bovines account only for 12.0%, it indicates that the farmers in this area prefer only in cattle and buffalo husbandry. It is, therefore, apparent that all extension programmes in this area should be concentrated to improve the bovine husbandry to utilize their products to the maximum extent and to produce fodder and suitable cheap feeds for them. Similar surveys in other areas are likely to indicate the preferences of the villages for a particular programme of development suitable for that area and extension programme should be so canalised as to exploit the local suitability and preference to maximum extent rather than to impose programmes which are not suitable to those environments nor interesting to the people of that area. This philosophy leads to the basis of planning of animal husbandry extension programmes that they cannot be stereo-typed for the entire country but should be based on similar surveys ascertaining the local suitability and interest of people.

Regarding the breeds of various species of animals, Hariana type is the most predominant breed of cattle in this region and even the desi animals in this area have some characters of this breed. The most common breed of buffaloes is the Murrah type although a few Ravi and Nili types are also available.

Distribution of cattle and buffaloes :—The following table (Table No. V) shows the distribution of cattle and buffaloes in each

village. It would be observed from this table, that buffaloes out-number the cattle in this region, accounting for 56.5% of the total bovines. According to Livestock Census Report of 1956 in Uttar Pradesh, the buffaloes account only for 29.9% of the total bovines while for whole of India, they are only 22.0% of the total bovines. This inordinate increase of buffaloes in this region is particularly significant when the figures of adult cows and adult buffaloes are compared. The ratio between adult cow to adult buffalo varies from 1: 1.3.8 to 3.7 with an overall average of 1:2.73. This proportion is significantly high in those villages where dairy industry is predominant. It is conventionally believed that in Mathura region cattle outnumber the buffaloes since mythologically this area was famous for cattle husbandry since the legendry of Lord Krishna revolved round the cow. But the data collected indicate that people in this area prefer the buffalo due to economic considerations and even during the interrogation of individual families, it was observed that they were keen for good buffalo bulls and good lactating buffaloes. The ban on cow slaughter seems to have accentuated the shift of economy in favour of the buffalo and apparently this animal seems to have a greater role in the future dairy industry of the country than it is at present presumed.

The preference of cow bullocks over buffalo bullocks for draught purposes is equally evident, the proportion between buffalo bullock to cow bullock ranged from 1 : 0.9 to 9.9 with an average of 1 : 2.7 observations indicate that there seems to be a growing tendency to use the male buffaloes for work in view of their increase in numbers in spite of their slow work and in one village there are more buffalo bullocks than the cow bullocks.

(To be continued in the next issue)

TABLES

Table No. I showing land distribution and holdings

Land situation	Villages					
	Umari	Nagari	Bakalpur	Bhainsa	Jachanda	Raal
Total cultivable land available in each village in acres.	482.8	171.8	108.0	514.8	277.4	664.4
Number of families possessing land	120	45	40	125	86	193
Number of families possessing no land	52	14	19	46	35	90
Average land available per family	2.9	2.9	1.8	2.8	2.3	2.4

Table No. II showing size and composition of families

Family composition	Villages					
	Umari	Nagari	Bakalpur	Bhainsa	Jachonda	Raal
Number of families	172	59	59	171	121	283
Total population	999	311	350	1126	719	1948
Average size of family	5.9	5.2	5.9	6.5	5.9	6.8
Number of males	292	88	99	315	220	636
Number of females	276	79	93	281	191	503
Number of children	431	144	158	530	308	809
Ratio between females : males : children	1.0 : 1.05: 1.56	1.0 : 1.11: 1.82	1.0 : 1.06: 1.69	1.0 : 1.12: 1.89	1.0 : 1.15: 1.61	1.0 : 1.26: 1.60

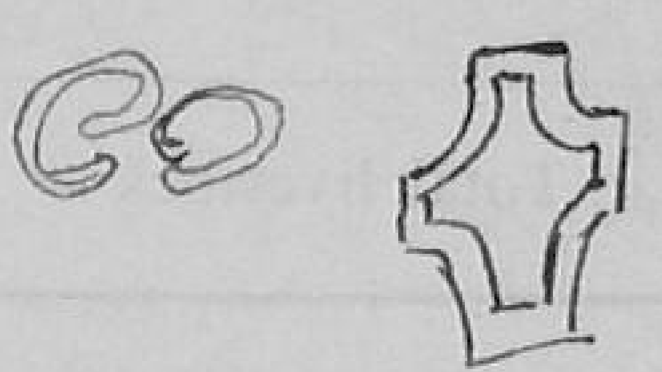


Table No. III showing distribution of livestock

Distribution of livestock	Villages					
	Umari	Nagari	Bakalpur	Bhainsa	Jachonda	Raal
Total livestock population	680	219	244	938	643	1246
Number of families having livestock	141	54	51	152	107	132
Number of families having no livestock	31	5	8	19	14	51
Number of families having land and livestock	115	41	38	120	83	187
Number of families having livestock but no land	28	13	13	32	25	46
Number of families having land but no livestock	10	5	3	7	5	7
Number of families having 1 to 4 livestock	80	40	31	69	61	12
Number of families having 5 to 9 livestock	49	13	17	58	31	81
Number of families having 10 to 19 livestock	11	1	1	19	4	28
Number of families having 20 and more livestock.	1	0	2	6	1	1

TABLE IV

Showing types of livestock

Type of livestock	Villages					
	Umari	Nagari	Bakalpur	Bhainsa	Jachonda	Raal
Total number of cattle	247	87	76	346	231	489
Total number of buffaloes	388	124	108	459	312	656
Total number of horses	—	—	—	3	4	26
Total number of donkeys	—	3	3	15	4	5
Total number of sheep	—	—	12	32	51	10
Total number of goats	37	—	45	52	10	44
Total number of pigs	—	3	—	31	12	12
Total number of poultry	8	2	—	—	15	—
Total number of camels	—	—	—	—	4	4
Total livestock	680	219	244	938	643	1246

GOSAMVARDHANA

IS AN IDEAL MEDIUM FOR ADVERTISING

Advertisement Rates :—

Full Page .. .. Rs. 100

Half Page .. .. Rs. 50

Quarter Page .. .. Rs. 25

* 15% Agency Commission

* 10% rebate for six consecutive insertions

Please write to :

THE OFFICIAL SECRETARY

Central Council of Gosamvardhana

PATAUDI HOUSE. NEW DELHI.

ANALYSIS OF MILK

and the effects of STAGE AND NUMBER of Lactation on its composition

by Shri M. Misra
Shri N. C. Nayak

According to Imp. Cattle Breeding Farm (1934) Karnal, 40 milk samples belonging to Hariana breed on analysis revealed : Specific Gravity, 1.031; Fat percent 4.60; and Solids not fat (S.N.F.) percent 9.68 and 50 milk samples of Tharparkar breed gave: Specific Gravity, 1.031; Fat percent, 4.60; and S.N.F.%, 9.63. As per Imp. Dairy Inst. (1940) Bangalore, an analysis of 2500 milk samples of Red Sindhi breed gave 4.65% fat. Similarly Military Dairy (1916) Peshawar analysed 134 Sahiwal milk samples which showed; Specific Gravity. 1.032; Fat percent, 4.65; and S.N.F.% 9.20. Apart from these findings, various authors have reported on the average lactose, protein and ash percentages of milk from different breeds. Sen and Dastur (1947) analysed 57 Red Sindhi composite herd samples and found the lactose percent to be 5.06. Stewart and Banerjea (1930-31) reported the average lactose content of 64 samples of cow milk to be 4.45%. Brahmachri (1934) analysed 86 samples of cow milk and found the average lactose and ash contents to be 3.5% and 0.74% respectively. Seshan (1937) reports the average protein content of cow milk to be 3.02. Bunce (1932) found the average ash content of cow milk to be 0.75% whereas Raysarkar (1943) reports the same for Hariana breed as 0.77%. With regard to acidity of milk, Caulifield and Riddell (1936) reported the average acidity of milk from Ayrshire as 0.160%; Holstein, 0.161%; Guernsey, 0.172%; and Jersey, 0.179%. No records of acidity for Indian pure breeds of cows are available to the best knowledge of the authors.

With regard to the effect of stage of lactation on the composition of milk Ragsdale & Turner (1922) repoted. "The fat content of milk declines during the first 2 or 3 months of lactation. Following this, there is a gradual increase, becoming more pronounced near the end of lactation." Sommer (1952) reports "The S.N.F. content is high in colostrum, declining during first month to a point which is maintained fairly uniformly during the greater part of lactation. About two months before the close of lactation the S.N.F. content starts to increase," gradually at first and then quite sharply towards the very close. Trunz (1903) reported that the ash content of milk remains constant in amount upto within the last 2 or 3 months of lactation and during final months of lactation there is a definite increase in total ash.

In respect of the effect of number of

lactations on composition of milk Bartlett (1934) found in cows a gradual, uniform decrease in S.N.F. content with each successive lactation. But Ragale et al (1958) found in buffaloes that animals having 4 or more lactations gave higher averages for butter fat and Total Solids contents followed by 2nd calvers. In case of protein and S.N.F. the highest averages were obtained by 2nd calvers followed by older animals. Buffaloes calving for the first time gave lowest value for all milk constituents.

In India the maximum amount of milk supply is from the indigenous cows of the rural areas compared to that of the pure breeds of cows belonging to Red Sindhi, Hariana and such other breeds. From the literature cited above it may be seen that rare records are available regarding the milk analysis and the effects of stage and number of lactation on its composition in the indigenous and nondescriptive cattle in India. In view of this, the authors have attempted in this paper to assess above factors for the indigenous cows of Orissa.

Materials and Methods

Milk samples were collected from 35 indigenous cows of Bubhaneswar town, Orissa. Collection of the milk samples was done on the spot by the authors themselves or by reliable laboratory workers from cows, while being milked to avoid the possibilities of adulteration. Therefore all the 35 samples were genuine milk. While collecting milk from a cow her number and stage of lactation were also recorded. The age of the cows could not be ascertained as they were indigenous cows without any authentic record. Out of the 35 cows only one was pregnant. So the effects of age and pregnancy on the composition of milk of these cows could not be ascertained. Within one to two hours of collection of milk samples, they were subjected to laboratory test such as acidity, specific gravity, fat, total solids (T.S.), Solids not fat (S.N.F.), Protein, lactose, and ash percentages. The acidity was conducted by volumetric method ; specific gravity, by thermolactometer, fat percent by Gerber's method ; T.S. by gravimetric method ; S.N.F. by deducting fat from T.S. ; Protein by aldehyde method (Ling 1956) ; ash by gravimetric method (Aggarwala 1953) ; and lactose by deducting the sum of fat, protein and ash percentages from T.S.%.

Results

As may be seen from table I, the specific gravity, acidity and lactose percent are practically the same during both the rising and declining phases of lactation. But the rise in fat% during declining phase is 38.4% over the rising phase and the same for T.S. is 13.3% ; S.N.F., 2.8% ; Protein, 4.8% and ash, 5.9%.

TABLE I

Averages of milk constituents, specific gravity, and acidity

No. of individual samples examined	Phase of lactation	Average specific gravity	Average percentages of						
			Acidity	Fat	T.S.	S.N.F.	Lactose	Protein	Ash
14	Rising Phase (upto 3 months)	1.0318	0.172	3.90	13.16	9.27	5.363	3.27	0.64
21	Declining phase (beyond 3 months)	1.0313	0.169	5.40	14.92	9.53	5.421	3.43	0.678
35	Entire lactation	1.0315	0.170	4.65	14.04	9.40	5.392	3.35	0.659

The results indicate that the fat, T.S., S.N.F., protein, and ash contents are low in early lacation and they increase during late lacation. The Table I also shows the averages of 35 individual milk samples in specific gravity, acidity, fat, T.S., S.N.F., lactose and ash contents to be 1.0315%, 0.170%, 4.65%, 14.04%, 9.40%, 5.392% 3.35% and 0.659% respectively.

The 35 cows used in this experiment were grouped according to the stage of their lactations monthwise and the averages of the ash, protein, fat, lactose, S.N.F. and T.S. percentages of milk from each of these groups were calculated and these are tabulated in table II. Similarly all the cows were grouped as per their number of lactations and the averages of the above milk constituents for each group of animals were calculated and they are tabulated in table III.

TABLE II

Composition of milk at different stages of lactations

Particulars	Lactation in months														
	1	2	3	4	4½	5	6	7½	8	9	9½	10	11	12	18
Ash%	0.65	0.59	0.7	0.71	—	—	0.68	—	—	0.71	—	—	—	0.70	0.85
Protein%	2.93	3.43	3.87	—	—	—	3.37	—	3.22	3.34	—	3.57	3.50	—	3.99
Fat%	3.65	3.57	4.00	—	—	5.10	5.00	5.07	—	—	5.17	—	6.45	—	6.75
Lactose%	5.43	5.29	5.38	5.54	—	5.30	5.83	—	5.43	5.24	—	5.37	—	5.17	5.28
S.N.F.%	9.02	9.32	9.46	—	9.36	—	9.56	—	9.55	—	—	9.96	—	—	10.18
T.S.%	12.67	12.88	14.06	14.62	—	14.61	14.92	—	—	—	—	15.46	15.74	—	16.88

TABLE III

Composition of milk at different number of lactations.

Particulars	Number of lactation			
	1	2	3	4
Ash%	0.668	0.644	0.724	0.623
Protein%	3.32	3.16	3.58	3.50
Fat%	4.20	4.50	4.60	5.90
Lactose%	5.344	5.180	5.717	5.421
S.N.F.%	9.33	8.99	10.02	9.54
T.S,%	13.57	13.50	14.63	15.47

From Table II it can be seen that the ash content remains more or less constant till 9th month of lactation and beyond it in 12th and 18th months its increase is pronounced. The protein content is lowest in 1st month and after this its level is more or less maintained until 11th month and during 18th month it shows a pronounced rise. The fat content is high in the 1st month, showing a decline in 2nd month, after which there is a gradual rise till 9½ months beyond which the rise becomes quite sharp. The lactose content remains more or less the same throughout the lacation period. The S.N.F. content is lowest in 1st month, after which its level is more or less maintained till the 9th month and at 10th month and beyond it the rise is more pronounced. The T.S. content is lowest in the 1st month after which it shows a rising trend until 6th month beyond which the rise is more pronounced

Table III depicts the effects of number of lactation on the composition of milk. All cows taken in this experiment were within their 4th lactation. So the effects of the number of lactation beyond 4th lactation on the composition of milk could not be studied. It can be seen from the above table that the fat content shows a gradual rising trend from 1st till 4th lactation. Similar is the case with T.S. content. The S.N.F. content is more or less the same during both 1st and 2nd lactations, showing a rise in 3rd and a decline in 4th lactation. Similar is the case with lactose, protein and ash contents.

Summary

1. 35 milk samples from the individual indigenous cows of Orissa have been analysed.

2. The averages for different milk constituents as well as specific gravity and acidity for the above cows have been assessed.

3. The effects of stage and number of lactation on the composition of such milk have been ascertained.

(From Indian Vety. Journal)

Always insist on

DECO

MILK TESTING MACHINE

It stands for Quality
Durability
Workmanship

Available in all sizes :

DOSHI & SONS

OPP. CIVIL COURT
P. O. BOX NO. 14,
ANAND (Gujrat)

Contd. from the Previous Issue

NINTH ALL-INDIA LIVESTOCK CENSUS (1961)

ABSTRACT STATEMENT OF CATTLE AND BUFFALOES

WEST BENGAL

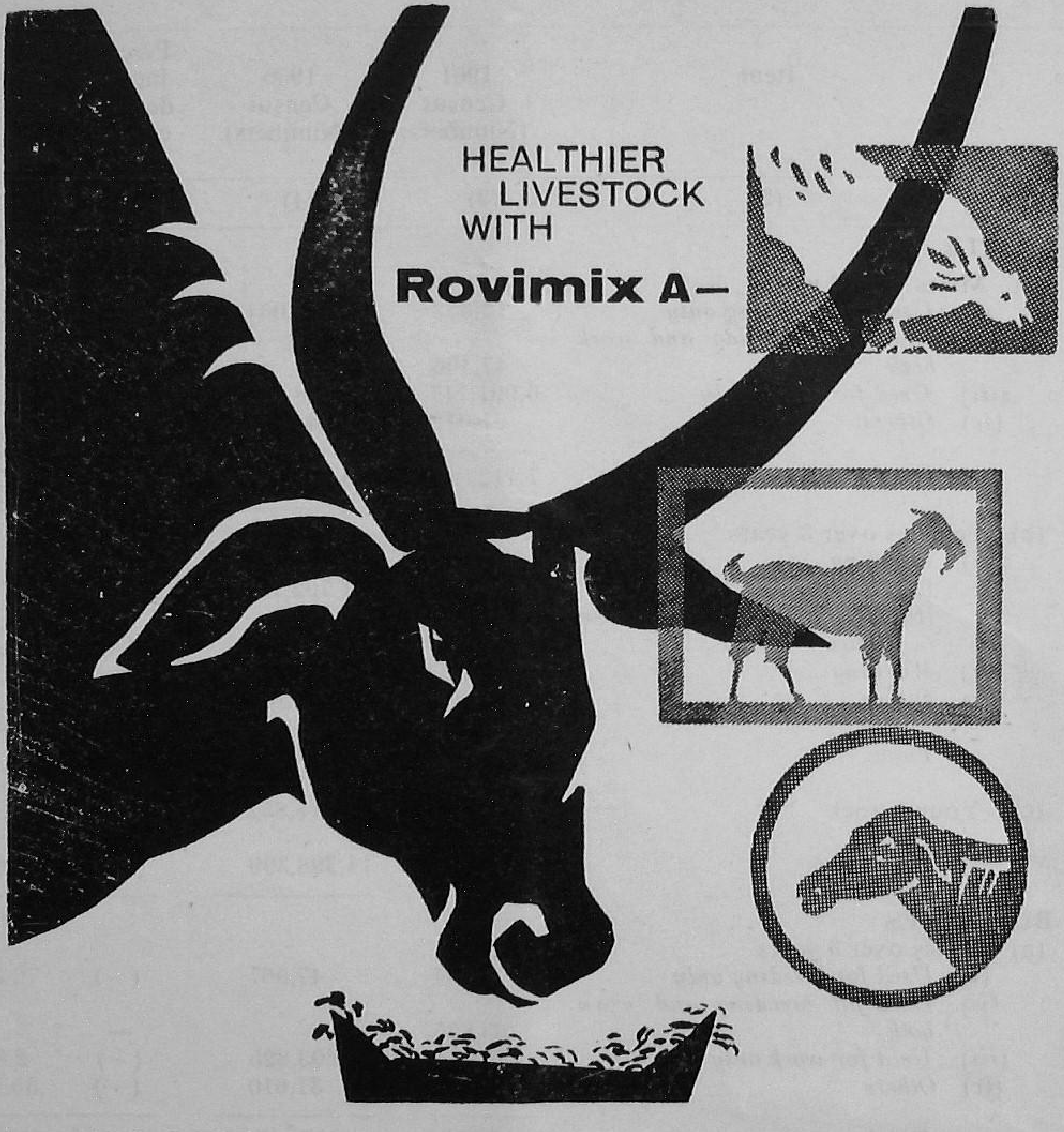
S. No.	Item	1961 Census	1956 Census	Percentage Increase (+) or decrease (–) of Col. 3 over Col. 4
(1)	(2)	(3)	(4)	(5)
1.	**CATTLE**			
	(a) Males over 3 years			
	(*i*) *Used for breeding only*	43,710	40,073	(+) 9.1
	(*ii*) *Used for breeding & work both*	146,891	69,724	(+) 110.7
	(*iii*) *Used for work only*	4,256,795	4,165,267	(+) 2.2
	(*iv*) *Others*	88,746	140,073	(–) 37.0
	Total	4,536,142	4,415,937	(+) 2.7
	(b) Females over 3 years			
	(*i*) *Breeding*			
	(*a*) *In milk*	1,967,942	1,361,066	(+) 44.6
	(*b*) *Dry & not calved even once*	1,851,704	2,155,320	(–) 14.1
	(*ii*) *Working*	32,840	30,066	(+) 9.2
	(*iii*) *Others*	51,945	65,568	(–) 20.8
	Total	3,904,431	3,612,020	(+) 8.1
	(c) Young Stock	3,024,239	3,080,199	(–) 1.8
	Total Cattle	11,464,812	11,108,156	(+) 3.2
2.	**BUFFALOES**			
	(a) Males over 3 years			
	(*i*) *Used for breeding only*	8,160	8,242	(–) 1.0
	(*ii*) *Used for breeding & work both*	38,389	14,831	(+) 158.4
	(*iii*) *Used for work only*	439,491	478,339	(–) 8.1
	(*iv*) *Others*	19,460	11,861	(+) 64.1
	Total	505,500	518,273	(–) 1.5
	(b) Females over 3 years			
	(*i*) *Breeding*			
	(*a*) *In Milk*	159,664	67,930	(+) 135.0
	(*b*) *Dry & not calved even once*	100,211	62,562	(+) 21.4
	(*ii*) *Working*	6,801	10,958	(–) 37.9
	(*iii*) *Others*	4,365	3,222	(+) 35.5
	Total	271,041	164,672	(+) 64.6
	(c) Young Stock	171,909	110,656	(+) 55.4
	Total Buffaloes	948,450	788,601	(+) 20.3

S.N.	Item	1961 Census	1956 Census	% increase (+) or decrease (—) of col (3) over col (4)	
1	2	3	4	5	
1.	**CATTLE**				
	(a) Males over 3 years				
	(*i*) *Used for breeding only*	49,090	44,024	(+)	11.5
	(*ii*) *Used for breeding & work both*	89,605	—		—
	(*iii*) *Used for work only*	22,14,527	17,41,355	(+)	27.2
	(*iv*) *Others*	92,030	1,36,322	(—)	32.5
	Total	24,45,252	19,21,701	(+)	27.2
	(b) Females over 3 years				
	(*i*) *Breeding*				
	(*a*) *In milk*	11,69,263	9,31,676	(+)	25.5
	(*b*) *Dry & not calved even once*	6,74,828	5,76,775	(+)	17.0
	(*ii*) *Working*	1,01,929	1,27,611	(—)	20.1
	(*iii*) *Others*	75,022	62,666	(+)	19.7
	Total	20,21,042	16,98,728	(+)	19.0
	(c) Young stock	20,31,202	16,02,192	(+)	26.8
	Total Cattle	64,97,496	53,08,748	(+)	22.4
2.	**BUFFALOES**				
	(a) Males over 3 years				
	(*i*) *Used for breeding only*	10,168	10,607	(—)	4.1
	(*ii*) *Used for breeding & work both*	29,784	—		—
	(*iii*) *Used for work only*	1,80,638	1,73,906	(+)	3.9
	(*iv*) *Others*	8,106	12,695	(—)	36.1
	Total	2,28,696	1,97,208	(+)	16.0
	(b) Females over 3 years				
	(*i*) *Breeding*				
	(*a*) *In Milk*	85,329	81,279	(+)	5·0
	(*b*) *Dry & not calved even once*	83,729	87,111	(—)	3.9
	(*ii*) *Working*	33,382	20,810	(+)	60.4
	(*iii*) *Others*	9,480	6,986	(+)	35.7
	Total	2,11,920	1,96,186	(+)	8.0
	(c) Young stock	1,29,993	1,25,511	(+)	3.6
	Total Buffaloes	5,70,609	5,20,665	(+)	9.6

Sl. No.	Item	1961 Census (Numbers)	1956 Census (Numbers)	Percentage of increase (+) or decrease (—) of col. 3 over col. 4.
1	2	3	4	5
1.	**CATTLE**			
	(a) Males over 3 years			
	(*i*) *used for breeding only*	35	42	(—) 16.7
	(*ii*) *used for breeding & work both*	243	—	—
	(*iii*) *used for work only*	1,650	1,146	(+) 44.0
	(*iv*) *Others*	284	16	(+) 1675.0
	Total	2,212	1,204	(+) 83.7
	(b) Females over 3 years			
	(*i*) *Breeding*			
	(*a*) *In milk*	1,984	590	(+) 236.3
	(*b*) *Dry & not calved even once*	796	593	(+) 34.2
	(*ii*) *Working*	38	2	(+) 1800.0
	(*iii*) *Others*	44	4	(+) 1000.0
	Total	2,862	1,189	(+) 140.7
	(c) Young stock	2,314	1,522	(+) 52.0
	Total Cattle	7,388	3,915	(+) 88.7
2.	**BUFFALOES**			
	(a) Males over 3 years			
	(*i*) *used for breeding only*	7	6	(+) 16.7
	(*ii*) *used for breeding and work both*	378	—	—
	(*iii*) *used for work only*	4,341	2,021	(+) 114.8
	(*iv*) *Others*	53	25	(+) 112.0
	Total	4,779	2,052	(+) 132.9
	(b) Females over 3 years			
	(*i*) *Breeding*			
	(*a*) *In milk*	679	826	(—) 17.8
	(*b*) *Dry & not calved even once*	1,320	794	(+) 66.2
	(*ii*) *Working*	51	8	(+) 537.5
	(*iii*) *Others*	34	10	(+) 240.0
		2,084	1,638	(+) 27.2
	(c) Young stock	1,494	1,548	(—) 3.5
	Total Buffaloes	8,357	5,238	(+) 59.5

S. No.	Item	1961 Census (Numbers)	1956 Census (Numbers)	Percentage of increase (+) or decrease (—) of Col. 3 over Col. 4
(1)	(2)	(3)	(4)	(5)
1.	**CATTLE**			
	(a) Males over 3 years.			
	(i) Used for breeding only	26,915	20,398	(+) 31.9
	(ii) Used for breeding & work both	226,019	—	—
	(iii) Used for work only	3,612,513	3,300,119	(+) 9.5
	(iv) Others	101,405	86,500	(+) 17.2
	Total	3,966,852	3,407,017	(+) 16.4
	(b) Females over 3 years			
	(i) Breeding			
	(a) In milk	892,517	627,023	(+) 42.3
	(b) Dry & not calved even once	1,777,073	1,714,485	(+) 3.7
	(ii) Working	184,871	160,359	(+) 15.3
	(iii) Others	74,377	60,203	(+) 23.5
	Total	2,928,838	2,562,070	(+) 14.3
	(c) Young stock	2,086,791	1,893,352	(+) 10.2
	Total Cattle	8,982,481	7,862,439	(+) 14.2
2.	**BUFFALOES**			
	(a) Males over 3 years			
	(i) Used for breeding only	51,322	47,955	(+) 7.0
	(ii) Used for breeding & work both	54,336	—	—
	(iii) Used for work only	461,557	381,221	(+) 21.1
	(iv) Others	38,547	14,729	(+) 161.7
	Total	605,762	443,905	(+) 36.5
	(b) Females over 3 years.			
	(i) Breeding			
	(a) In Milk	96,441	67,615	(+) 42.6
	(b) Dry & not calved even once	174,519	129,602	(+) 34.7
	(ii) Working	38,938	32,842	(+) 18.6
	(iii) Others	11,164	8,677	(+) 28.7
	Total	321,062	238,736	(+) 34.5
	(c) Young stock	189,213	146,136	(+) 29.5
	Total Buffaloes	1,116,037	828,777	(+) 34.7

S.No.	Item	1961 Census (Numbers)	1956 Census (Numbers)	Percentage of increase (+) or decrease (—) of col. 3 over col. 4	
(1)	(2)	(3)	(4)	(5)	
1.	**CATTLE**				
	(a) Males over 3 years				
	(i) *Used for breeding only*	12,653	36,064	(—)	64.9
	(ii) *Used for breedidg and work both*	47,466	—	—	
	(iii) *Used for work only*	6,991,747	6,198,109	(+)	12.8
	(iv) *Others*	61,019	144,981	(—)	57.9
	Total	7,112,885	6,379,154	(+)	11.5
	(b) Females over 3 years				
	(i) *Breeding*				
	(a) *In Milk*	1,619,384	1,792,742	(—)	9.7
	(b) *Dry and not calved even once*	2,384,346	2,073,897	(+)	15.0
	(ii) *Working*	250,327	299,730	(—)	16.5
	(iii) *Others*	124,081	135,024	(—)	8.1
	Total	4,378,138	4,301,393		
	(c) Young stock	4,634,259	3,717,852	(+)	24.6
	Total cattle	16,125 282	14,398,399	(+)	12.0
2.	**BUFFALOES**				
	(a) Males over 3 years				
	(i) *Used for breeding only*	13,264	47,967	(—)	72.3
	(ii) *Used for breeding and work both*	65,855	—	—	
	(iii) *Used for work only*	586,934	603,825	(—)	2.8
	(iv) *Others*	14,070	31,610	(—)	55.5
	Total	680,123	683,402	(—)	0.6
	(b) Females over 3 years				
	(i) *Breeding*				
	(a) *In Milk*	778,605	800,166	(—)	2.7
	(b) *Dry and not calved even once*	775,428	683,310	(+)	13.5
	(ii) *Working*	74,835	102,317	(—)	26.9
	(iii) *Others*	23,904	32,907	(—)	27.4
	Total	1,652,772	1,618,700	(+)	2.1
	(c) Young stock	1,529,923	1,124,348	(+)	36.1
	Total buffaloes	3,862,818	3,426,450		



'ROCHE' Synthetic Vitamin A for animal feeds

Experiments carried out the world over have proved that the addition of Vitamin A to feeds has beneficial effects on the growth of livestock. Roche, pioneers and leaders in the synthesis of vitamins, have specially developed Rovimix A for ensuring a regular and good supply of Vitamin A in animal feeds. The growth, development, reproductive ability and general health of your livestock and poultry are better when you add Rovimix to their feeds!

ROCHE

'ROCHE'
—pioneers and leaders
in the synthesis
of Vitamins

ROCHE PRODUCTS LIMITED, Bombay 1

For detailed information, please write to:
Sole Distributors: VOLTAS **VOLTAS LIMITED**
Bombay · Calcutta · Madras · New Delhi · Bangalore
Gauhati · Kanpur · Secunderabad · Ahmedabad

IWT.VT. 1157

Place of Cattle in Indian Economy

by

Ghan Shiam Singh Rajorhia

Professor of Animal Husbandry & Dairying, Janata Agriculture College, Ajitmal (Etawah)

CATTLE play a very important role in Indian Agriculture. Unlike other countries of the world whose cattle are maintained mainly for milk and meat, in India their primary purpose is draught for the plough or the loading cart. "Without the Ox," wrote the Royal Commission on Agriculture in India, "no cultivation would be possible, without the Ox no produce can be transported." They supply almost all the motive power required for almost all the agricultural operations such as ploughing, lifting water, and the transport of produce to the market. They provide most of the manure used by the farmer in India, and enable him to learn and earn during the spare time by carting for hire. They again yield valuable products such as Milk, Butter, and Ghee, food products particularly in a country with a vegetarian dietary habits as the only source of high quality protein and the essential growth factors.

India is a country with developing economy rich in natural resources and man power. Her resources, human as well as material are capable of fuller exploitation and more intensive utilization. According to 1955-56 preliminary estimates the total National Income approximated to about Rs. 9650 crores out of which 4100 crores were derived from Agriculture and allied activities. Thus agriculture contributes to nearly half of the country's national income. Roughly three-fourths of the people are directly engaged or dependent on agriculture and pastoral pursuits for their livelihood. Here agriculture is not merely an occupation or a business proposition for the people, it is a tradition—a way of life which for centuries has shaped their thoughts, outlook and culture.

In so far as the country like India is essentially a farming country the importance of the efficient cattle for the stability and prosperity of the nation can scarcely be exaggerated. From the very infancy of the Aryan civilization the Cow and the Bull have occupied a privileged and honoured position by dint of their sheer usefulness and beneficience. The cow has been held sacred in our country—a symbol of maternal productivity and gentle purity. She is regarded as the sustainer of creation, dispeller of poverty and bringer of joy by turning inauspicious low grade nutrients of farm crops into auspicious ones. Almost every product of the cow is of great use to us. Its milk provides the basic ingredients of a healthy diet which is treated as the elixir of life in the Indian vegetarian menu. Cow is also an excellent source of manure rich in all the ingredients required for the growth of the plants. She even after her death provides hide and skin which are valuable raw materials for the manufacture of many useful articles.

Recently the cow dung has been used for the production of Gobar Gas which shall be utilized to generate power and electricity for running village industries and lightning purpose. This shall popularize the value of Gobar as the important raw material for developing village industries at a tremendously fast speed and bring more profits and pleasure to the Indian farmer.

Their Contribution to National Income :

It is difficult to assess accurately the monetary value of the contribution made by the cattle and buffalo to the national income in India. Firstly, a large proportion of the produce is consumed by the producers instead of being marketed and valued thereafter. Secondly, in many areas cattle are kept more for draught purposes than for the production of milk and it is difficult to estimate accurately the value of cattle labour. In addition the great, difficulty lies in the estimation of value of meat which is not a staple article of diet and for which allowance is to be made. However some idea of the potential value of cattle to Indian agriculture can be secured from the following estimates :—

Dr N.C. Wright has valued the total production of milk and milk products from cattle to about Rs. 300 crores per year, which is in fact equivalent in value to India's total output of rice and three to four times the value of the output of wheat. The annual output of products such as hide and skin is valued roughly to Rs. 40 crores, which is more than the total output of sugar industries (30 crores). According to the Planning Commission, Govt. of India Report on IInd 5 year plan the net value of livestock products amounted to Rs 664 crores approximately in the year 1950-51 or Rs 2 crores per day. The National Income Committee in the year 1954 reported a total income from livestock amounting to Rs. 11,043 million. The value of Agricultural labour and road transport separately are estimated to be Rs. 4,000 million and 1,500 million respectively. Dr. Bhabha stated at the "Atom for Peace" conference in Geneva that India's total hydroelectric potential when fully harnessed could deliver 1/7 of the energy obtained from cow-dung. While the National Income Committee reports that the cow dung used as fuel contributes more than 90 crores to national income. This compares with 46 crores from coal, Rs. 23 crores from wood fuel, and Rs. 21 crores from electricity. G.K. Sharma and T.T. Malvani estimated the value of cow dung to be approximately 312 crores of Rupees in 1950.

More recently in an estimate "contribution of livestock in Indian ecanomy" made by S.N. Singh in 1957 and presented to "Animal Science" 402 class the total income came to about 2325 million dollars. Of this 2283.5 m. dollars were contributed plainly through milk and products, cow dung used as fuel and meat, hides and skins. This did not include the cost of tillage and transport. It is thus well known fact that their fiscal cantribution including milk, power and manure should roar to about 50 percent of the total agricultural revenue, which in its own turn is round about 50% of the national income. Thus, undoubtedly, our bovine population is nucleus of prime significance in our national wealth and health having alarmingly high dormant potentialities without the exploitation of which our progress of agriculture will remain at a stake and the cherished chapter of our national prosperity cannot be unfolded.

Present Position of Livestock :—

India holds the pioneer position so far as the number of livestock in the country is concerned. According to the 8th census of livestock population in 1956 there were 158.6

......undoubtedly, our bovine population is nucleus of prime significance in our national wealth and health having alarmingly high dormant potentialities without the exploitation of which our progress of agriculture will remain at a stake and the cherished chapter of our national prosperity cannot be unfolded.

million cattle which when compared to world population appears to be 19%. While the buffaloes turned to 44.6 million or 50% of the total buffaloes of the world, it may of course grace us being the owner of a huge bovine population—numbering a little over the world's 1/4th cattle population, but our proud vanishes on visualizing the prevailing per capita consumption of milk which is only 5.5 oz. per day leaving us to this strange paradoxical puzzle of scarcity in the land of plenty. This is against a figure of 56 oz. of Newzealand, 45 oz of Australia, 38 oz. of U.K. and about 35 oz. of U.S.A. Again within India itself the 5.5 oz is not a uniform average and its variations limit as low as 1.2 oz. Such a situation has emerged out of the poor yield of our milch animals due to multiferious causes. Besides the majority of the existing ones is characterized by stunted growth resulting in delayed maturity, weak and emaciated condition and long calving intervals. The salient factors responsible for this deplorable and deteriorated condition of our livestock are the lack of adequate attention and care, continuous sub optimum nutrition and neglected breeding.

The way to solution :—

Henceforth, if the productive performance of our cattle is to be rehabilitated, which should really be the first essential step, the plan of their feeding, breeding and management should be laid on some fundamentally sound system. In this regard it should be noted that the cattle are the backbone of Indian agriculture, animal labour is perhaps the main contributor to soil fertility, and if Indian agriculture is to maintain the nation in health the efficiency of cattle population must be maintained at a high level. ●

Please Rush with Your Orders

Only Limited Copies Available

Bi-Lingual Publication "Cattle In The Farm Economy"

(Special Gosamvardhana issue 1961-Price Re. 1.50 nP.)

Hindi Edition of The Special Number "Behabilitation of The Cow"

(Price per copy 60 nP.)

Are available For Sale

Place Your Orders With

The Central Council of Gosamvardhana

Pataudi House, New Delhi.

"For well over 20 years, Equipment supplied by "Cirugia" have been turning the wheels of Animal Husbandry practices. These classic 'De Lux' products have won the confidence of technical men every where for enduring quality and dependability. That's why you'll find these equipment in hospitals where-ever you go in India."

CIRUGIA DE LUX PRIVATE LTD.

CALCUTTA-13 BOMBAY-1 MADRAS-8

Printed and published by Y.M. Parnerkar, Secretary (Non-official), Central Council of Gosamvardhana, New Delhi at The Albion Press, Kashmere Gate, Delhi-6.